UNITED STATES COURT OF APPEALS FOR THE FEDERAL CIRCUIT
88-1209, -1210

THE LAITRAM CORPORATION and INTRALOX, INC.,

Plaintiffs-Appellants,

v.

CAMBRIDGE WIRE CLOTH COMPANY,

Defendant-Appellee.

DECIDED: December 12, 1988

Before MARKEY, Chief Judge, NICHOLS, Senior Judge, and RE, Chief Judge.*

The Laitram Corporation and Intralox, Inc. (Laitram) appeal from a judgment of the United States District Court for the District of Maryland, No. 2 83-3126, finding that the Cambridge Wire Cloth Company (CWC) did not infringe Patent Nos. 3,870,141, 4,051,949, and Re.30,341. We reverse and remand.

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*The Honorable Edward D. Re, Chief Judge of the Court of International Trade, sitting by designation.

Background

In 1983, Laitram sued CWC for infringement of U.S. Patents 3,870,141 ('141), 4,051,949 ('949), 4,159,764 ('763) and Re.30,341 ('341). The accused products were CWC's modular plastic conveyor belt (CAM-CLEAN I) and a belt drive system. In 1985, the U.S. District Court for the District of Maryland upheld the validity of the patents, found each infringed, and enjoined further infringement. Laitram Corp. v. Cambridge Wire Cloth Co., 226 USPQ 289 (D. Md. 1985), aff'd in part, rev'd in part, 785 F. 2d 292, 228 USPQ 935 (Fed. Cir.), cert. denied, 107 S.Ct. 85 (1986) (the first trial). In a thorough and comprehensive opinion, the court outlined CWC's failed effort to obtain rights to the patented invention through merger,

acquisition, or joint venture, followed by CWC's engagement of a design firm to "incorporate features similar to Laitram patents." Id. at 291. The court correctly interpreted the claims and fully described the inventions and patents in that opinion.

In mid-1986, CWC filed and the court denied a motion to exclude form the injunction a "redesigned" module (CAM-CLEAN II). In November 1986, CWC sought a judgment declaring CAM-CLEAN II non-infringing. The court dismissed that suit. When CWC began manufacture of CAM-CLEAN II, Laitram sued for infringement of claim 1 of the '141 patent, claim 21 of the '949 patent, and claim 1 of the '341 patent. Broadly, the '141 patent discloses plastic modules having links joinable by plastic rods to create a

conveyor belt; the '949 patent discloses a module with raised ribs; and the '341 patent discloses a sprocket drive system for conveyor belts.

Laitram moved for a preliminary injunction for a finding of contempt. The court consolidated all matters before it and conducted a six-hour trial on November 12, 1987.[1] In an opinion dictated from the bench, the court found that CAM-CLEAN II infringed none of the three asserted claims and denied the contempt motion.

Issues

1. Whether the district court erred in determining non-infringement of the asserted claims of the '141, '949, and

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[1]Laitram says "only minutes were allowed for consideration of the '949 and '341 issues." Because no such objection was presented to the district court, it is disregarded here.

'341 patents.

2. Whether the district court properly denied the contempt motion.

OPINION

Introduction

This appeal again illustrates one of the many difficult dichotomies that lurk in the lacunae of patent law. On one side rests the very important, statutorily-created necessity of employing the clearest possible wording in preparing the specification and claims of a patent, one of "the most difficult legal instruments to draw with accuracy."[2] On the other lies the equally important, judicially-created necessity of determining infringement without the risk of injustice that may

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[2] Sperry v. Florida, 373 U.S. 379,, 383 (1963) (quoting Topliff v. Topliff, 145 U.S. 156, 171 (1892)).

result from a blindered focus on words alone. The former, set out in 35 U.S.C. § 112, recognizes a competitor's need for precise wording as an aid in avoiding infringement. The latter is called the "doctrine of equivalents". While requiring a look at all the words while resisting their tyranny,[3] and requiring, because the claims measure the invention, a look at all claim limitations, the doctrine, in a proper case, "temper[s] unsparing logic and prevent[s] an infringer from stealing the benefits of an invention." Graver Tank & Mfg. Co. v. Linde Air Prods. Co., 339 U.S. 605, 608, 85 USPQ 328 at 330 (1950)(quoting Royal Typewriter Co. v. Remington Rand, 168

[3]Rich, Escaping the Tyranny of Words--Is Evolution in Legal Thinking POssible?, 60 JPOS 271 (1978); Chafee, The Disorderly Conduct of Words, in Freedom's Prophet 35 (E. Re ed. 1981).

F.2d 691, 692, (2d Cir. 1948) (L. Hand, J.)). In that sense, the doctrine recognizes a fact of the real business world: words are not misappropriated; claimed inventions are.[4]

In the present case, the semantic antics of counsel at trial and in their briefs on appeal have obfuscated the true nature of the dispute as it must be perceived in law.[5] That obfuscation led in turn to a failure to apply the "substantially the same function in substantially the same way to obtain substantially the same result" guidance

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[4]The competing policies present in 35 USC § 112 and the doctrine of equivalents are exhaustively discussed in the additional opinions filed in Pennwalt Corp. v. Durand-Wayland, Inc., 833 F.2d 931, 4 USPQ2d 1737 (Fed. Cir. 1987). In this case, it is unnecessary to repeat that discussion.

[5]Counsel for each side accuses the other of sanctionably distorting and misrepresenting the record. Each recasts arguments of the other and then attacks the recasted arguments.

of Graver Tank, 339 U.S. at 608, 85 USPQ at 330.[6]

The basic facts are either undisputed or accepted here as found by the district court. The difficulty with the appealed judgment lies in the district court's application to the facts of the law governing determinations of infringement.

1. Infringement

The '141 Patent

(a) Claim Interpretation

Claim 1 of the '141 patent reads:

> 1. A module for constructing linked structures, said module comprising in combination:
> a first plurality of link ends of substantially identical width, each being formed to circumscribe a pivotal hole, said hole of said first plurality being arranged coaxially;

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[6]The quoted phrase appears repeatedly in the district court's earlier opinion, 226 USPQ at 294, 296, 297, 301, 302, 303, and 304, but appears nowhere in the opinion in this case and is nowhere found in CWC's brief.

a second like plurality of links of substantially identical width, each being formed to circumscribe a pivotal hole, said holes of said second plurality being arranged coaxially, the axes of respective holes of both pluralities of link ends being substantially parallel; and

a plurality of spaced apart elongated members each integrally formed with and joining a pair of corresponding link ends of said first and second pluralities, said members being joined by at least one cross rib also formed integrally therewith and extending parallel to said axes;

said link ends being dimensioned and spaced apart by a distance slightly greater than said width so that said module is end-to-end reversible, so that a plurality of said modules may be engaged with each other at said ends.

It is undisputed that all limitations of the claim, save the last, read directly on CAM-CLEAN II. The district court focused on the words "slightly greater", correctly viewing that adjectival phrase as a "sloppy term"

requiring for its interpretation reference to the specification, the prosecution, and the prior litigation:

> You cannot make exactly that determination [whether "slightly greater means .2 but not .3, or .3 but not .06."]. It is not exact. It is not scientific. It is a sloppy term, has no meaning for this case outside of the claims of Patent 141, as interpreted by the prosecution of that patent in the patent office and as interpreted by the prior history of this litigation, including Mr. Lapeyre's testimony, which is what he won on in the first suit.

Having had a witness measure the link end widths and the spacing between link ends of Laitram's commercial product and of the accused CAM-CLEAN II module, the court found the spacing in the former was 106% of the width and that in the latter was 135%.[7] Deeming the latter "more than

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[7]Laitram vigorously argues "plain error" in the district court's comparison with a commercial product instead of with the claim. CWC says Laitram failed to object at trial. In view of our disposition of the appeal, we need not and do

slightly greater", the court found noninfringement.[8] As discussed below, application of the law governing infringement by equivalents renders that ultimate finding of noninfringement clearly erroneous.

The phrase "slightly greater" is not presented in a vacuum. The claim contains definitional parameters: "so that said module is end-to-end

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not treat these arguments.

[8]There are, apparently, two versions of the belt called "CAM-CLEAN II", a "light duty" and a "heavy duty perforated top" version. The district court appears to have focused only on the former, for CWC's vice-president-in-charge of redesign testified twice on direct examination that no change was "ever made in the link end spacing of the heavy duty perf [sic] from CAM CLEAN I to CAM CLEAN II", and that the only change to that version was the (irrelevant) removal of spacers on two of 24 link ends. The "perforated top" was plaintiff's exhibit 58 in the first trial and was there found to be an infringement. 226 USPQ at 304. For convenience, we employ "CAM CLEAN II" here to designate the accused product dealt with by the district court. The parties' dispute on whether certain products were or were not accused of infringement in the first and second trials must be resolved, if at all, by the district court on remand.

reversible, so that a plurality of said modules may be engaged with each other at said ends".[9] In addition, the district court properly interpreted the claim in light of the prosecution history in the first trial, defining "slightly greater" spacing in terms of its purpose, i.e., spacing that would "minimize bending and maximize shear".

Assuming, arguendo, the district court's interpretation of the phrase "slightly greater", in the second trial, as the 106% width in Laitram's product, CWC's 135% width may be seen as avoiding a finding of literal infringement. The question would remain, however, of whether CWC's 135% width constituted a

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[9]After the first trial, the district court found that the CAM-CLEAN I product met the end-to-end definitional parameter. 226 USPQ at 296. Neither "so that" was discussed in the opinion from the bench after the second trial.

change sufficient to escape a finding of infringement under the doctrine of equivalents.

(b) Doctrine of Equivalents

In the first trial, the court found that CAM-CLEAN I constituted an "infringement by equivalents of claim 1." 226 USPQ at 298. In this trial, the court's entire discussion of equivalence with respect to CAM-CLEAN II, reads:

> It is true that all that has been done in the redesign of Cam-Clean II is an alteration of the spacing, relative spacing of the link ends.
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> That is true, but if the result is that when the patent language, the claim language is viewed in context of its prosecution history, as it has to be under the doctrine of equivalence (sic, equivalents), if the result is that even applying the doctrine of equivalence [sic] there is no longer a spacing between links that is only slightly greater than the width of the links, then there is no infringement. That is all there is to it. It is that simple.

> To me the telling proof is made up in two ways. Number one, the tests, in my opinion--although the difference is admittedly small at working loads, at the higher loads, where you would test to ascertain the true strength of the material--in my judgment the tests show that the Cam-Clean II is less resistant to the bending and elongation forces than the original Cam-Clean, but that is not real [sic] really the most important question.
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> The most important question is, what is the spacing of the redesign Cam-Clean relative to the width of the link ends?

The foregoing application of the doctrine of equivalents is legally flawed. Having determined that all CWC did was to alter the spacing, the court did not apply its own criterion derived from the prosecution history in the earlier trial, i.e., whether the "alteration" left the spacing such that it would still achieve the "minimize bending/maximize shear" purpose the court found as the measure of the "slightly

greater" phrase in the limitation. Applied to all the basic facts, the law required a finding that the spacing in CAM-CLEAN II was the equivalent of the "slightly greater" limitation in the claim.

The "tests" relied upon by the district court were non-probative for at least five reasons: (1) they subjected the CAM-CLEAN II to a force more than three times the 1500 pounds to which such belts are subjected in use and for which they are warranted (in the prior trial, the district court correctly rejected such tests because "the belt was subjected to forces way beyond the normal range that would be applied in a working situation" and because "There is nothing in Mr. Lapeyre's patent, even when considering file wrapper estoppel, that

claims that the rod is immune to bending in his invention under extraordinary conditions")[10]; (2) the "admittedly small" difference was an elongation, at the working load, of less than 1/5 the width of a human hair; (3) there is nothing in the "slightly greater" limitation dealing with any "strength of the material" criterion; (4) whether CAM-CLEAN II is "less" resistant is irrelevant if the test of equivalency is met; and (5) the tests did nothing to show that CAM-CLEAN II had been changed sufficiently to escape the equivalency formulation set out in Graver Tank.

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[10]In the first trial, the court noted ("Furthermore") that the rod in the test was uncapped. In the present tests, the rod was capped. The court did not note that fact in the present trial, but CWC's reliance on it before us is misplaced, for that fact cannot affect the principle that infringement is not escaped by proof that the accused product is less satisfactory under extreme circumstances not met in normal use.

In applying the doctrine, the "most important question", is not "what is the spacing," but whether the spacing in the accused product is equivalent to that in the claim, i.e., whether it continues to meet the district court's "minimize bending/maximize shear" criterion. If it does, the rest of the claim being fully met, CWC's CAM-CLEAN II and the claimed invention are substantially the same, used in substantially the same way, to achieve substantially the same result.

The criterion is not "zero bending/unlimited shear." That may be an ideal condition, but it is not claimed to be achieved by the invention. See U.S. v. Telectronics, Inc., No. 87-1445/1446, slip opinion at 6-7 (Fed. Cir. 1988) ("avoid fibrous tissue formation" did not mean there could be no fibrous tissue).

CWC asserts, and cites evidence to show, only that CAM-CLEAN II is less efficient, i.e., that it does not minimize bending and maximize shear quite as much as the claimed invention does. Assuming, arguendo, the truth of that assertion, it cannot alone prevent a finding of infringement under the doctrine of equivalents. Perkin-Elmer Corp. v. Computervision Corp., 732 F.2d 888, 901, 221 USPQ 669, 679 (Fed. Cir. 1984) ("exact identity of results is not required in establishing equivalency"). That application of the doctrine arises out of a recognition of a second real-world phenomenon: inefficient infringement is still infringement.[11]

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[11]While CWC is telling the courts that CAM-CLEAN II is inferior to CAM-CLEAN I and the claimed invention, the record contains its communications in which CWC is telling customers and potential customers that CAM-CLEAN II is "an even better product" than CAM-CLEAN I, and that

CWC does not dispute its vice president's testimony that CAM-CLEAN II performs substantially the same function to achieve substantially the same result as CAM-CLEAN I, that CWC sells CAM-CLEAN II modules as interchangeable replacements for CAM-CLEAN I, and that CWC warrants CAM-CLEAN II for use at the same maximum working strength (1550 lbs/ft) as CAM-CLEAN I. Nor does CWC dispute Laitram's assertion that CWC shaved only 11/1000 of an inch off its link ends. CWC does assert, irrelevantly in this case, that it added plastic to

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belts formed of CAM-CLEAN II modules are "engineered for maximum strength". Nowhere does the record reflect that CWC admits to the real world what it tells us in its brief in this court, i.e., that "CAM-CLEAN II is significantly weaker and it pays significant other penalties for not infringing" including "increased slop in the belt, a highly undesirable feature" (ignoring its vice-president's testimony that when the belt is "installed the slop would not be an operable factor."). The district court found, as indicated infra, that CAM-CLEAN II at operating loads was "not significantly weaker".

beef up the link ends, a change described in a deposition of CWC's vice-president as "insignificant." Most significantly, the Graver Tank formula for equivalence appears nowhere in CWC's brief and nowhere does CWC suggest, nor does it show any basis for finding, that CAM-CLEAN II does not perform "substantially the same function in substantially the same way to obtain substantially the same result."[12]

(c) Prosecution History

The district court's discussion of the prosecution history and its effect on range of equivalents to which claim 1 was entitled was this:

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[12]CWC does not argue that CAM-CLEAN II corresponds to the prior art, nor that a range of equivalents sufficient to encompass CAM-CLEAN II would encompass the prior art. Indeed, CWC's vice-president in charge of the redesign testified that CWC did not use any of the prior art in arriving at CAM-CLEAN II.

> That is, Mr. Lapeyre, although he has [sic] acknowledged as a pioneer inventor and certainly is the first person that came up with the idea of this plastic modular belting, which is a wonderful idea, nonetheless, he could not make a broad claim that would get through the patent office. He tried it. He tried a very broad claim.
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> * * *
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> It is true that the belt is not, at rated operating load, significantly weaker than the original Cam-Clean belt was; and if, in fact, Mr. Lapeyre were entitled to a broad claim here that covered all modular plastic belting with multiple links, then certainly the Cam-Clean II, as redesigned, would still infringe and I would so hold. But he is not entitled to a broad patent.

The "very broad claim" referred to is necessarily the broadest, i.e., claim 1 as originally filed. The amendment added "by a distance slightly greater than said width" after "apart". The court went on to cite file history arguments and the inventor's testimony in the earlier

trial, all in support of its perfectly correct determination that the purpose of spacing no more than slightly greater was to minimize bending and maximize shear.[13] It is clear that a module in which the spacing was so great as to have no or very little effect in minimizing bending and maximizing shear would not accomplish the purpose attributed to the "slightly greater" limitation, but that is not this case. Nor did the district court find, as it could not on this record, that CAM-CLEAN II's spacing had a minimize bending/maximize shear effect substantially different from that

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[13]The focus on the phrase "slightly greater" tended to obscure the importance of other claim elements contributing to minimizing of bending and the maximization of shear, "spacing" unrelated to other elements having no effect. Claim 1 was actually amended four times. Two of the intermediate amendments spoke of resistance to "bending forces". That language was deleted before allowance.

intended by the limitation, or from that of CAM-CLEAN I, or from that of Laitram's product.[14]

The court erred in treating the amendment of claim 1 and arguments in the file history as sufficient to preclude a finding of infringement under the doctrine of equivalents. It is not necessary, of course, that an inventor be entitled to a broad claim covering all possible products in a line of products before a court may award an invention

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[14]CWC's vice president in charge of its redesign effort testified that it began with a delta spacing of 112 thousandths of an inch, then reduced it to 100 thousandths, then reduced it further to the 80 thousandths finally chosen as the spacing in CAM-CLEAN II, a classic exposition of the process by which one may proceed in appropriating an invention (albeit with a little-less-than-perfect embodiment) in the belief that one is evading words in a claim. In opposing Laitram's motion for preliminary injunction, CWC submitted a drawing of the intermediate, non-chosen version with 100 thousandths spacing.

pioneer status,[15] or a range of equivalents sufficient to encompass a particular accused product. It is commonplace for claims to inventions, pioneer and non-pioneer, to be amended during prosecution. Though the "area of equivalence" may vary, the doctrine of equivalents is applicable to both, Graver

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[15]If the district court meant to find that claim 1 set forth a pioneer invention, it should have awarded that invention a very wide range of equivalents. Laitram included in the appendices a copy of the Memorandum and Order issued by the District Court for the Eastern District of Wisconsin in Rexnord, Inc. v. The Laitram Corporation and Intralox, Inc., No. 85-C-1039, (Jan. 28, 1988) in which the court found, citing evidence, that the inventions disclosed in the '141 and '949 patents "revolutionized the industry and warrant[s] pioneer status." CWC does not discuss the "pioneer" question, but says Rexnord issued after the district court's decision in this case and involved a different defendant and a different accused product, neither of which assertions is relevant to whether the invention is of a pioneer nature. Because the district court in the present case did not expressly find the invention either pioneer or non-pioneer, and because the Rexnord Memorandum and Order were not before the district court and are not before this court in this appeal, we deem it unnecessary to treat the"pioneer" question in reaching our conclusions here.

Tank, 339 U.S. at 608, 85 USPQ at 330. Thus it was not necessary that the present inventor be entitled to a broad claim covering "all modular plastic belting with multiple links" before it could be determined that "CAM-CLEAN II, as redesigned, would still infringe."

What counts is the thrust of an amendment and remarks in the prosecution history. Here the amendment added "by a distance slightly greater than said width" and the inventor's remarks described the purpose of such limited spacing (necessarily in cooperation with the rest of elements in the claim) as being to minimize bending and maximize shear. From the absence of any finding that CAM-CLEAN II did not minimize bending and maximize shear, and from the district court's uncontested finding that

the "difference is admittedly small at working loads", and from the district court's uncontested finding that CAM-CLEAN II, even at extraordinary loads, is only "less resistant to bending and elongation forces", and from the district court's effectively uncontested finding that "the belt is not, at operating load significantly weaker," and from CWC's admission that CAM-CLEAN I and II are interchangeable and identically warranted, it can only be concluded that in CAM-CLEAN II bending is minimized and shear is maximized. Nothing in the prosecution history of the '141 patent conflicts in any manner with that conclusion.

(d) Conclusion on the '141 Patent

Every limitation in claim 1, or its equivalent (the spacing in CAM-CLEAN II

being equivalent to "slightly greater"), is thus found in CAM-CLEAN II. Compare Pennwalt, 833 F.2d at 939, 4 USPQ2d at 1743 (means-plus-function claim is not infringed under the doctrine of equivalents when accused device includes no component performing one of functions listed in claim or an equivalent function). The simple fact that the spacing, measured in 1000ths of an inch, is greater in CAM-CLEAN II than in Laitram's commercial product, or greater than in CAM-CLEAN I, or greater than some generalized notion of "slightly", is irrelevant when the spacing is insufficient to move CAM-CLEAN II outside the guidance of Graver Tank. Application of the law governing determination of equivalents to the established facts requires a finding of infringement.

The '949 Patent

Claim 21 reads:

21. A linked belt adapted to move through a circular arc for use in conjunction with a conveyor comb having a plurality of spaced apart parallel teeth, said belt comprising:

a plurality of like modules, each of said modules including a first and second like pluralities of link ends of substantially identical width, each such end being formed to circumscribe a pivotal hole through said width;

means for joining said pluralities to one another so that the axes of said holes of said first plurality are arranged coaxially, the axes of said holes of said second plurality are arranged coaxially and the axes of respective holes of both pluralities of link ends are substantially parallel,

a plurality of spaced apart elongated upstanding vanes mounted on said modules so as to extend in a substantially parallel direction to one another in a direction transversely to the axes of said holes of said both pluralities and protrude substantially perpendicularly from said module;

said link ends being dimensioned and spaced apart by a distance

slightly greater than said width. said link ends of each of said modules being releasably engaged between the link ends of an adjacent module except for individual link ends disposed at the extreme sides of said belt;

means for pivotally connecting said modules at engaged link ends;

said elongated vanes of each said modules being arranged in staggered relation with respect to the vanes of adjacent modules, said vanes of each module being spaced from one another sufficiently to form a multiplicity of channels lying beneath the upper most surface of said belt when staggered, said channels being adapted to receive said teeth.

It being undisputed that CAM-CLEAN II met each limitation save the fourth after "comprising", the district court focused again on the "slightly greater" limitation in determining non-infringement of claim 21. Recognizing that the prosecution history of the '949 patent contained nothing about spacing, the court cited the prosecution history

of the '141 patent[16] and the inventor's testimony relating thereto in the first trial, to the effect that the purpose of the spacing was to minimize bending and maximize shear. The court found noninfringement, again without reference to the guidance in Graver Tank, concluding:

> So, I think you are estopped to reclaim any broader sense of the claim language in Claim 21, 949 that is readable in claim 1 of 141. Therefore, I find no infringement of Claim 21, 949 because in my judgment the Cam-Clean II as redesigned does not have spacing between adjacent link ends then [sic, that] is only slightly greater than the width of the link

[16]Laitram correctly argues that the prosecution history of the '141 patent cannot in itself create an estoppel in relation to the separate '949 patent for which application was filed more than a year after the '141 patent issued. Ignoring the district court's statement that it did apply the prosecution history of the '141 patent (which it called the "mother" patent), CWC says, incorrectly, that the district court relied only on judicial estoppel in view of the inventor's earlier testimony. In view of our disposition of the appeal, we need not and do not treat these arguments.

ends; and therefore I find no infringement of Claim 21 of 949.

Thus, the district court found noninfringement of the asserted claims of the '141 and '949 patents on the same basis. For the reasons outlined above in respect of claim 1 of the '141 patent, a finding of infringement of claim 21 of the '949 patent is required.

The '341 Patent

(a) The Claim

Claim 1 reads:

> A sprocket and drive shaft assembly for a chain link conveyor belt subject to variations in width comprising, in combination:
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> a drive shaft with a substantially uniform, noncircular cross section; and
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> a plurality of sprockets mounted in driven engagement on said shaft for supporting and driving a conveyor belt; one of said sprockets being releasably locked against axial motion to provide for proper belt tracking, all other of said sprockets being free to move axially.

There was in this second trial no question of any "redesign" of CWC's sprockets. The district court stated the '341 patent issue before it:

> The question also is presented with regard to whether the sale of square drive sprockets by CWC and the sale of round bore keyed drive sprockets by CWC constitutes an infringement of Claims 1 and 3 of reissued Patent 341.[17]

(b) Claim Interpretation

In the first trial, CWC admitted that its sale of sprockets constituted contributory infringement and limited its defense to an assertion of invalidity. In holding that CWC had failed to carry

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[17] Infringement of claim 3 was not alleged in the complaint for infringement or on this appeal. It was, apparently, involved in Laitram's motion for a holding of contempt. The court necessarily meant that the question was whether CWC's sale of sprockets constitutes contributory infringement. Because CWC conceded infringement in the first trial, there was no need to prove direct infringement and it was not there necessary for Laitram to prove that a purchaser of CWC sprockets had fixed one and allowed the others to "float".

its burden of sustaining that defense, the district court had this to say about the invention claimed in the '341 patent:

> The essence of patent '341 is the need to maintain a positive drive relationship between the sprocket and the belt while taking into account the lateral expansion in the belt caused by fluctuations in temperature when the belt is put to applications where the product is conveyed from hot to cold or cold to hot areas. This was a problem in practice for Mr. Lapeyre which he satisfied by coming up with the idea embodied in '341, that is fixing the central drive sprocket and allowing the other two or more lateral drive sprockets to float. Additionally, to avoid the problem of loss of a key or shearing of a key (I take judicial notice that keyed devices are frequently subject to having the key sheared and thus losing the drive connection) he came up with the idea of making the shaft on which the sprockets are mounted square. I do find that it was a known principal [sic] at the time this invention was made that a square shaft could be substituted for a keyed round shaft. This was a principle of mechanical design. I also find that Claghorn and Comstock each showed sprocket drive mechanisms that were not all fixed

in position along a drive shaft. However, none of them showed a combination of one fixed and several free floating sprockets, whether mounted on a keyed round shaft or on a square shaft. (Emphasis added).

* * *

Therefore, the notion of the free float of several sprockets, while fixing one central sprocket to maintain positive drive is not disclosed in any of the patents. So, I find that the use of one fixed and severally completely floating unrestrained sprockets was not obvious from the prior art. Furthermore, applying the test of obviousness, that is, that something in the prior art must itself suggest the combination of all the ingredients of the patent I do not find anything in Comstock, Cremona, Claghorn and the prior art cited by the Patent Office that suggests putting together that "one fixed and several free floating" arrangement, together with a non-round shaft. Variations on the non-round shaft have been around for years in one application or another. (Emphasis added).

* * *

With regard to infringement of the '341 patent, it is not contested. The sprocket as manufactured by Cambridge and as taught in their

> engineering devices, has one fixed and several free floating it's [sic] on a square shaft and it clearly, literally infringes.

226 USPQ at 298-99.

In opposing Laitram's motion for contempt, CWC described the invention claimed in the '341 patent:

> The Patent's claims in issue, Claims 1-3, are directed to a sprocket and drive shaft assembly for a chain link conveyor subject to variations in width with the elements comprising a drive shaft of substantially uniform non-circular cross section and a plurality of sprockets mounted in driving engagement on the shaft to drive the conveyor belts, one of the sprockets being releasably locked against axial movement to provide belt tracking and all other sprockets being free to move axially. Thus, the Patent is not directed to square bore sprockets per se, or even the combination of square bore sprockets and square bore shafts. Instead, the Patent covers the specific combination of non-circular bore sprockets and non-circular shaft, one of the sprockets being fixed and the others free to move axially on the shaft. (Emphasis added).

(c) Infringement

CWC sells two types of sprockets, referred to by the district court and CWC as "round bored" and "square bored". A cylindrical keyed shaft was referred to as "round" and "circular". For convenience, we employ the district court's terminology.

In finding that CWC's sales of its "round bored" sprockets did not constitute contributory infringement, the district court said:

> Now, the next question pertinent to the reissue of 341 patent is whether the plaintiff Laitram has proved by a preponderance of the evidence that the sale of sprockets that are to be fitted into a shaft that is essentially round in cross-section but that has rectangular key ways installed -- in particular, the application shows that the -- not the patent application but the practical application -- shows that there are two key ways horizontally opposed around the periphery of the shaft, the round shaft, and that

that is the mechanism that fixes the sprocket into position on the shaft, that transmits the motion of the shaft to the sprocket, and I do find that the plaintiff has not proved by a preponderance of the evidence that this device infringes on reissued Patent 341, even when it is sold in an installation where one of the sprockets is fixed and the other is floating axially along the shaft.

The reason I so hold is that I find that that Laitram is estopped from its position taken and testimony made in a prior trial, as well as my prior findings with regard to this to say that the round shaft with key ways is the functional equivalent of a square board [sic, shaft].

It is evident from Claims 1 and 3 of reissued 341 and also the narrative in column 4 of that patent, especially lines 39 to 43, that the benefit claimed from the square drive is the better transmission of force, which is accomplished by the use of a regular polygon.

Now, certainly there is nothing in the patent that explicitly says that there has to be a regular polygon; and here I am talking about something that does not have circular sides but something with straight sides, like a hexagon or a square. There is nothing in the patent that limits

it to an irregular polygon. The language, in fact, says, substantially uniform in cross-section and noncircular, or words to that effect.

Now, certainly, the round shaft with keys is substantially uniform in cross-section because as you go up and down it, the cross-section is the same. The question is whether it is noncircular. It is true that if you trace a line around the periphery, it is uncircular, but under any practical construction of the patent in light of the testimony of Mr. Lepeyre at the prior trial -- and here I am talking about a transcript, page 59, with regard to keys in a circular shaft or a round shaft, that his idea of a circular shaft includes a circular shaft that has key ways in it or key ways in the shaft to hold keys that transmit the force to the sprocket. That is what he said, and in his judgment that was essentially -- or that, not essentially, that was a circular shaft. His idea is noncircular.

The particular embodiment of it in Claim 3 is square Claim 1 is broader but still noncircular, [sic, and] in my judgment does not cover the round shaft with keys which is a technology that has been known for donkeys' years and, in fact, would not itself be a patentable device and that is quite

obvious; and, further, if you look at my oral opinion in the other case at 299, I indicated in there that the square shaft was adopted for the reason of avoiding the problem of loss of a key or shearing of a key.

And this is consistent with Mr. Lepeyre's testimony and I find that a round shaft with keys is essentially a circular shaft. It is not a noncircular shaft, as that is used in 341, as the inventor himself views what is a circular and noncircular shaft; and I think that the resolution of this is clear and the inventiveness in 341 was putting together the square shaft or other regular polygonal shaft, which gives you a very positive drive mechanism, putting that together with fixing one sprocket and letting others float.

And frankly, I think that it would be a result that would be inequitable and not in conformity with the evidence that has already been laid before the Court and therefore would not be a sustainable result for me to say now, that, oh, yes, well, the circular shaft with keys is the functional equivalent of a square shaft and therefore the circular shaft with keys infringes. That would be an inequitable result and one that is not allowed, given the fact that I think it's fair to

> estop the Plaintiff from adopting that position in light of the history of the 3126 [the first trial] case, the testimony of Mr. Lepeyre in that case, and my findings with regard to this issue. (Emphasis added).

The inventor's testimony described by the court as found in the "transcript, page 59" was this:

> Q. And could you explain the problems that relate to the use of round shafts and tell the Court why you went to a square shaft and the rest?
>
> A. Well in a round shaft, with a sprocket having a round bore, the sprocket in some way must be fastened, prevent it from rotating on the shaft. Otherwise it would be useless as a driving member. Therefore, key seats are cut into the shaft, key seats are cut into the sprockets, keys are put into those key seats. Set screws are put in to hold the keys in position. If any of those parts get loose, or if they fall into the machine you have a devil of a time getting them out, so I didn't like that. Number two, whereas you can make a key sloppy fit into a shaft, it's a poor, it tends to be a poor guide for axial guidance of the sprocket, as the sprocket wants to move along the shaft.

As Laitram correctly points out, the foregoing testimony dealt only with the inventor's reasons for selecting a square shaft and square bored sprockets as his preferred, commercial embodiment. It could not, therefore, estop the inventor from asserting that a keyed cylindrical shaft is the functional equivalent of a square shaft. Similarly, Laitram correctly points out that "column 4 of that patent, especially lines 39 to 43", cited by the court, merely described the preferred embodiment. The entire sentence runs from line 36 to 43 and reads:

> Although other noncircular cross sections such as hexagonal may be employed, the square cross section is preferred because it provides maximum strength coupled with maximum driving force--imparting surfaces and corners, is symmetrical with respect to the rotational axis and lends itself to fabrication simply and easily of a

variety or combination of materials.

That the inventor preferred and adopted commercially a square shaft, because keys tend to fall out of keyed shafts, is not a basis for limiting claim 1 to square or polygonal shafts. References to a preferred embodiment, such as those often present in a specification, are not claim limitations. SRI Int'l. v. Matsushita Elec. Corp. 775 F.2d 1107, 1121, 227 USPQ 577, 589 (Fed. Cir. 1985) (in banc). Such reference is thus not a basis here for limiting "noncircular" to square or regular polygonal shafts.[18]

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[18]The prosecution history of the '341 patent was not discussed by the district court, unlike that of the '141 patent, and does not appear in the appendix presented by the parties on this appeal. CWC does not argue that claim 1 is limited to square or polygonal shafts by the prior art. CWC does argue that the court's earlier decision "inferentially" interpreted the '341 patent to exclude keyed cylindrical shafts, and (without citation to the record) that the inventor's testimony at the first trial

CWC points to a single statement in the inventor's testimony at the first trial (to which the district court made no reference in this case). That statement was that any engineering professor would view a section of the prior art Claghorn shaft as a circular cross section because a keyway has been milled in. The next question in that testimony, however, was directed to whether Claghorn's shaft met the "noncircular" limitation, to which the inventor answered, "It's up in the air, I guess. I would say to bracket that if it's noncircular cross section." Nothing in that testimony would estop the inventor from reliance on the functional equivalency of square and keyed

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distinguished keyed shafts "to save his patent from prior art." Neither argument is sustainable on the record.

cylindrical shafts or from asserting that the sale of keyed cylindrical shafts and round bored sprockets for such shafts, for use in an installation in which one sprocket was fixed on the shaft and the other sprockets were free to float axially, constituted contributory infringement under the doctrine of equivalents.

As above indicated, the district court held in its opinion after the first trial that none of the prior art "showed a combination of one fixed and several free floating sprockets, whether mounted on a keyed round shaft or on a square shaft," and that "it was a known principle . . . that a square shaft could be substituted for a keyed round shaft," and that "variations on the non-round shaft have been around for years in one application

or another," and that "[T]he essence of patent '341 is the need to maintain a positive drive relationship between the sprocket and the belt" in light of expansion caused by temperature fluctuations.[19] Thus, the court, in considering the validity issue, interpreted the claim as drawn to fixed and free floating sprockets on a non-round shaft, without regard to the particular cross sectional shape of the non-round shaft. "Having construed the claims one way for determining their validity, it is axiomatic that the claims must be construed in the same way for

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[19]A keyed shaft obviously provides a positive drive mechanism (at least until the key breaks or falls out) and thus satisfies the "in driven engagement" limitation of the claim. The appendix contains no firm basis on which to evaluate the parties' opposing positions on whether keyed shafts and round bored sprockets were charged to infringe at the first trial, and whether, after the first trial, CWC paid royalties on both types of shafts and sprockets.

infringement." W. L. Gore & Assoc., Inc. v. Garlock, Inc., 842 F.2d 1275, 1279, 6 USPQ2d 1277, 1280 (Fed. Cir. 1988). Here, the district court committed legal error in interpreting claim 1 differently for infringement, i.e., as though it were limited to use of a square or other regular polygonal shaft ("The inventiveness in 341 was putting together the square shaft or other regular polygonal shaft, which gives you a very positive drive mechanism, putting that together with fixing one sprocket and letting others float.").

Claim 3 is limited to a square shaft and claim 6 is limited to a regular polygonal shaft. The doctrine of claim differentiation precludes a reading of those limitations into claim 1 in determining literal infringement.

D.M.I., Inc. v. Deere & Co., 755 F.2d 1570, 1574, 225 USPQ 236, 239 (Fed. Cir. 1985). Apart from literal infringement, the district court recognized that a keyed cylindrical shaft is the functional equivalent of a square shaft.[20] It declined, however, to find infringement under the doctrine of equivalents because it felt that that result would be "inequitable". The basis for that view was that it was "fair to estop" Laitram from reliance on the doctrine in light of the history of the prior trial including the inventor's prior testimony. If the

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[20] "[A] square shaft could be substituted for a keyed round shaft"; "whether mounted on a keyed round shaft or on a square shaft"; "Variations on the non-round shaft have been around for years." 226 USPQ at 298, 299. In the first trial, CWC stipulated to infringement without reference to square or keyed shafts and sprockets, CWC's expert testified that keyed and square shafts are obviously functional equivalents, and CWC's counsel repeated that obvious fact in closing argument.

inventor had led the court to sustain claim 1 of the patent in the first trial on the basis that claim 1 must be limited to noncircular shafts that are square or otherwise polygonal in cross section, a judicial estoppel might have precluded any change from that position. Colonial Refrigerated Transp., Inc. v. Mitchell, 403 F.2d 541, 550 (5th Cir. 1968). As above indicated, however, we can find no indication in the record that that is what happened, or could have happened, here.

(d) Conclusion on the '341 Patent

The district court erred in applying the law of contributory infringement when it declined to find that sale of CWC's keyed cylindrical shafts and corresponding sprockets, for use in installations in which one sprocket is

fixed and the others float, constituted contributory infringement of claim 1 of the '341 patent.[21]

2. Contempt

Absent infringement, there cannot be contempt for violating an injunction. KSM Fastening Sys. v. H.A. Jones Co., 776 F.2d 1522, 1528, 227 USPQ 676, 680 (Fed. Cir. 1985).[22] As the district court

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[21]The district court found that Laitram had not proved that CWC was "selling the square drive sprockets in an infringing fashion," based solely on the undocumented testimony of CWC's vice president Bailey that CWC instructed customers to use them in "an installation wherein either all of the sprockets float or all of the sprockets are fixed," even though Bailey admitted that neither such installation would work, that he "wouldn't think that he [the customer] would want to do that," that CWC required no assurance of compliance from customers, and that if a customer wants to use a square drive sprocket, "they are up to their own on that." Laitram supplied no evidence of direct infringement by customers, however, and has not on this appeal challenged the district court's holding that it failed to carry its burden of proving that CWC sold square shafts and square bored sprockets for an installation in which sprockets were both fixed and floating.

[22]CWC sold a square shaft and square bored sprockets to a customer after the injunction was entered. When Laitram charged that sale as a

correctly stated, the standard for proof of infringement is "by a preponderance of the evidence" and the standard for contempt is "by clear and convincing evidence." Having found that Laitram failed its burden under the lesser standard, the court necessarily denied Laitram's motion for contempt in view of the court's noninfringement findings. Those findings having been reversed, remand becomes necessary to enable the district court to exercise its discretion in determining whether CWC's conduct amounted to contempt. See MAC Corp. v. Williams Patent Crusher & Pulverizer Co., 767 F.2d 882, 226 USPQ 515. (Fed. Cir. 1985).

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contempt, CWC submitted an affidavit that it had arranged for return by the customer of the square shaft and square bored sprockets for substitution of keyed shafts and round bored sprockets.

CONCLUSION

The portions of the judgment based on findings that claim 1 of the '141 patent and claim 21 of the '949 patent were not infringed by sales of CAM-CLEAN II, and that claim 1 of the '341 patent was not contributorily infringed by sales of keyed round shafts and round bored sprockets, are reversed. The case is remanded for consideration of the motion for contempt.

REVERSED AND REMANDED

UNITED STATES COURT OF APPEALS
FOR THE FEDERAL CIRCUIT

88-1209 - 1210

THE LAITRAM CORPORATION and
INTRALOX, INC.,

Plaintiffs-Appellants,

v.

CAMBRIDGE WIRE CLOTH COMPANY,

Defendant-Appellee.

JUDGMENT

On Appeal from the UNITED STATES DISTRICT COURT FOR THE DISTRICT OF MARYLAND

in CASE NO(S). S 83-3126

This CAUSE having been heard and considered, it is

ORDERED and ADJUDGED: REVERSED AND REMANDED

ENTERED BY ORDER OF THE COURT

Dated Dec 12 1988 /s/
Francis X. Gindhart,
Clerk

ISSUED AS A MANDATE: February 1, 1989
Costs: Against; Appellee
Printing. $1,980.24
Total 1,980.24

UNITED STATES COURT OF APPEALS
FOR THE FEDERAL CIRCUIT

88-1209, -1210

THE LAITRAM CORPORATION and
INTRALOX, INC.,

Plaintiffs-Appellants,

v.

CAMBRIDGE WIRE CLOTH COMPANY,

Defendant-Appellee.

Before MARKEY, Chief Judge, NICHOLS, Senior Judge, and RE, Chief Judge.*

O R D E R

A petition for rehearing having been filed in this case,

UPON CONSIDERATION THEREOF, it is

ORDERED that the petition for rehearing be, and the same hereby is, denied.

*The Honorable Edward D. Re, Chief Judge of the Court of International Trade, sitting by designation.

The suggestion for rehearing in banc is under consideration.

FOR THE COURT

January 25, 1989 /s/
Francis X. Gindhart
Clerk

cc. PAUL H. HAYES
G. FRANKLIN ROTHWELL

UNITED STATES COURT OF APPEALS
FOR THE FEDERAL CIRCUIT

88-1209, -1210

THE LAITRAM CORPORATION and
INTRALOX, INC.,

Plaintiffs-Appellants,

v.

CAMBRIDGE WIRE CLOTH COMPANY,

Defendant-Appellee.

O R D E R

A suggestion for rehearing in banc having been filed in this case,

UPON CONSIDERATION THEREOF, it is

ORDERED that the suggestion for rehearing in banc be, and same hereby is, declined.

FOR THE COURT

/s/
Francis X. Gindhart
Clerk

Dated: February 9, 1989
cc: PAUL J. HAYES
G. FRANKLIN ROTHWELL
LAITRAM V. CAMBRIDGE, 88-1209, 1210

UNITED STATES DISTRICT COURT
FOR THE DISTRICT OF MARYLAND

Nos. 83-3126

THE LAITRAM CORPORATION
and INTRALOX, INC.,

Plaintiffs,

v.

CAMBRIDGE WIRE CLOTH COMPANY,

Defendant.

DECIDED: November 12, 1987

Before SMALKIN, Judge.

THE COURT: Having heard the evidence presented today and the arguments of counsel on the motion for contempt in Civil Number S 83-3126, paper number 142, and also in the matter of a preliminary hearing which was advanced with a trial on the merits in Civil Number S 87-939, I now am going to enter an oral opinion

which contains my findings of fact and conclusion of law, whether specifically so denominated or not, pursuant to Federal Rule of Civil Procedure 52. I reserve a right to make any changes or amendment in the opinion, so long as I do not alter the result.

This matter can only be understood in light of the prior history of litigation and background of the patents as discussed in my opinion in Laitram versus Cambridge Wire Cloth Company -- that is, the S 83-3126 case as reported in 226 USPQ 289, opinion rendered March 19, 1985.

We are here today because the Defendant Cambridge Wire Cloth has attempted to redesign its plastic modular belting so that it no longer infringes the patent. I would say that they have

tried everything they could, which attempts were successfully resisted by the Court at the prompting of Mr. Hayes and the counsel for Laitram to get an advisory opinion of the Court prior to committing to manufacture or sale as to whether the redesign continued to infringe the patents.

Here in particular I am talking about the Cam-Clean II modular belting. I am not necessarily addressing -- in connection with redesign -- in fact, not at all in connection with redesign -- addressing the sprocket and drive mechanism.

The issues for decision are whether there has been contempt or there is now infringement in the context of the 939 case of Claim 1 of Patent 141 and Claim 21 of Patent 949 by the redesigned Cam-

Clean II modular belting. The question also is presented with regard to whether the sale of square drive sprockets by CWC and the sale of round bore keyed drive sprockets by CWC constitutes an infringement of Claims 1 and 3 of reissued Patent 341.

First, with regard to what the standard of proof is, the general standard of proof for civil contempt is by clear and convincing evidence. However, I have considered that this case joins for trial essentially that issue with the issue of the infringement substantively raised in Civil Number 939, 87-939; and obviously the burden there is by a preponderance. So I have first addressed the question of whether there is proof by a preponderance that the Cam-Clean II redesign infringes and that the

sale of sprockets infringes 341. Obviously, if there is not proof by a preponderance of the evidence there cannot be proof by clear and convincing evidence since a fortiori.

Turning first to the question of the square bore sprocket and the round bore circular sprocket, I find that the Plaintiff has not proved by a preponderance of the evidence that CWC is, in fact, selling the square drive sprockets in an infringing fashion. I find that the evidence is uncontradicted to the effect that instructions are given to customers that the square drive sprocket is to be used only in conjunction with an installation wherein either all of the sprockets float or all of the sprockets are fixed, and that does not infringe, and I so hold on the basis

of my prior opinion in 226 USPQ at 298-99 where I clearly held that the inventive aspect of the reissue 341 patent was the combination of a square drive sprocket with one fixed and the remainder floating and there cannot be infringement of that patent if the sprocket, square drive sprocket, is sold in the fashion that the uncontradicted evidence shows that it is sold by CWC.

Now the next question pertinent to the reissue of 341 patent is whether the Plaintiff Laitram has proved by a preponderance of the evidence that the sale of sprockets that are to be fitted into a shaft that is essentially round in cross-section but that has rectangular key ways installed -- in particular, the application shows that the -- not the patent application but the practical

application -- shows that there are two key ways horizontally opposed around the periphery of the shaft, the round shaft, and that that is the mechanism that fixes the sprocket into position on the shaft, that transmits the motion of the shaft to the sprocket; and I do find that the Plaintiff has not proved by a preponderance of the evidence that this device infringes on reissued Patent 341, even when it is sold in an installation where one of the sprockets is fixed and the other is floating axially along the shaft.

The reason I so hold is that I find that Laitram is estopped from its position taken and testimony made in a prior trial, as well as my prior findings with regard to this, to say that the

round shaft with key ways is the functional equivalent of a square board.

It is evident from Claims 1 and 3 of reissued 341 and also the narrative in column 4 of that patent, especially lines 39 to 43, that the benefit claimed from the square drive is the better transmission of force, which is accomplished by the use of a regular polygon.

Now, certainly there is nothing in the patent that explicitly says that there has to be a regular polygon; and here I am talking about something that does not have circular sides but something with straight sides, like a hexagon or a square. There is nothing in the patent that limits it to an irregular polygon. The language, in fact, says,

substantially uniform in cross-section and noncircular, or words to that effect.

Now, certainly, the round shaft with keys is substantially uniform in cross-section because as you go up and down it, the cross-section is the same. The question is whether it is noncircular. It is true that if you trace a line around the periphery, it is uncircular; but under any practical construction of the patent in light of the testimony of Mr. Lepeyre at the prior trial -- and here I am talking about a transcript, page 59, with regard to keys in a circular shaft or a round shaft, that his idea of a circular shaft includes a circular shaft that has key ways in it or key ways in the shaft to hold keys that transmit the force to the sprocket. That is what he said, and in his judgment that

was essentially -- or that, not essentially, that was a circular shaft. His idea is noncircular.

The particular embodiment of it in Claim 3 is square. Claim 1 is broader but still noncircular, in my judgment does not cover the round shaft with keys, which is a technology that has been known for donkeys' years and, in fact, would not itself be a patentable device and that is quite obvious; and, furthermore, if you look at my oral opinion in the other case at 299, I indicated in there that the square shaft was adopted for the reason of avoiding the problem of loss of a key or shearing of a key.

And this is consistent with Mr. Lepeyre's testimony and I find that a round shaft with keys is essentially a circular shaft. It is not a noncircular

shaft, as that is used in 341, as the inventor himself views what is a circular and noncircular shaft; and I think that the resolution of this is clear and the inventiveness in 341 was putting together the square shaft or other regular polygonal shaft, which gives you a very positive drive mechanism, putting that together with fixing one sprocket and letting others float.

And frankly I think that it would be a result that would be inequitable and not in conformity with the evidence that has already been laid before the Court and therefore would not be a sustainable result for me to say now, that, oh, yes, well, the circular shaft with keys is the functional equivalent of a square shaft and therefore the circular shaft with keys infringes. That would be an

inequitable result and one that is not allowed, given the fact that I think it's fair to estop the Plaintiff from adopting that position in light of the history of the 3126 case, the testimony of Mr. Lepeyre in that case, and my findings with regard to this issue.

Therefore, I find no infringement of the reissue 341 patent. That is, that the Plaintiff has not proven infringement by a preponderance of the evidence, ergot, the Plaintiff has not proved infringement by clear and convincing evidence; and the Defendant is entitled to prevail with regard to the 341 patent in 83-3126 and 87-939.

Turning to the more vexatious issue and one that has taken up more time and energy of counsel and the Court and witnesses in this case -- there is a

claim that the redesigned Cam-Clean belting, which will be referred to as Cam-Clean II, infringes Claim 1 of Patent 141 and Claim 21 of Patent 949.

I think it is conceded by counsel that unless each and every element of a claim is infringed either literally or by the doctrine of equivalence, there is no infringement. That is, something can infringe three out of four claims and does not infringe. There must be infringement of all claims.

The critical claim here is Claim -- as I said -- 1 of 141, and Claim 21 of 949; and the language is essentially identical that is relevant to the particular issues before the Court. And Claim 1 of 141 in particular the fourth element of Claim 1, it says as follows: "Said link end being dimensioned and spaced apart by a

distance slightly greater than said width --"

Now, I believe that said width refers to -- and I think this is agreed by all counsel -- said width means the width of the link ends themselves.

Continuing the quotation, " -- of the element of the claim so that said module is end to end reversible so that plurality of said modules may be engaged with each other at said ends."

I think it is fair to say that the question in the first trial came down to basically the same issue -- that is, whether the Cam-Clean belting was, in fact, spaced apart by a distance slightly greater than the width of the link ends -- that is, whether the space between the link ends was slightly greater than their

width; and that is what the whole case came down to.

Now, this is discussed in the earlier opinion in 226 USPQ at 297; and it is clear that my decision was based on Mr. Lepeyre's testimony with regard to the reason for having closed spacing of the link ends in his invention. And to view this in context, I must say that the way of this invention was paved with lots of prior art.

That is, Mr. Lepeyre, although he has acknowledged as a pioneer inventor and certainly is the first person that came up with the idea of this plastic modular belting, which is a wonderful idea, nonetheless, he could not make a broad claim that would get through the Patent Office. He tried it. He tried a very broad claim.

For example, as the claim originally came through -- it might take me a minute to find it -- but before it started to get amended, the claim -- the element I am talking about in 141 patent said, "Said links being dimensioned and spaced apart so that said module is end to end reversible."

Now, that is a very broad claim. The patent examiner rejected that and the patent examiner said, look, there is lots of prior art. You have to come in and amend your patent. So, it was amended and in the amendment the spacing language was inserted. So, as to said link ends being dimensioned and said averages slightly greater than said width -- this is -- I am now looking at Amendment A, which was filed with the patent office January 8, 1973.

And a narrative indicates that here at pages 8 to 9, "In the instant invention the link ends are dimensioned and spaced apart by a distance slightly greater than the width of the link ends. As a result, the end sections of the modules fit or are made snugly together and this snug fit contributes significantly to the ability of pivot connected modules to resist deformation due to bending forces across the axes of the pivot pin. The stresses are absorbed largely by adjacent link ends and a little shear is transmitted to the pivot pin. As a result, the strength required for the pivot rod is small as compared with conventional conveyors, with the result of polymeric materials can be used to form the pivot pins as well, thus tending

to eliminate the need to lubricate the belt.

Now, that is not the only comment with regard to this. There are other comments throughout the patent history; and, for example, I turn to the rejection of even the amended patent, and then you have another amendment that was submitted and -- let's see -- received by the Patent Office sometime in -- well, it is dated 3/1/74; and, again, there is talk about the engagement of the link ends providing structural strength to resist bending.

It is admitted that such resistance to bending cannot be provided by a structure in which a large number of modules do not have plurality of link ends but only single link ends. This is at page 14.

Now, granted, that does not directly address the quarrel with prior art; but

the net result of all this was that when you got to trial, Mr. Lepeyre gave his testimony of the purpose for maintaining each of the adjacent link ends slightly greater, as expressed in the claim, and the width of the link end. And here I am talking about his direct testimony, at pages 21 and 22, 23.

He is talking specifically about the planar alignment of the link ends; and, as I read the testimony, he clearly said that you want to get as little exposed space of pivot rod as possible because the link ends exposed pivot rod. You have the link ends bending. You have -- the more shear you have; and the shear resistance is more efficient than bending resistance and is what you want to maximize strength.

This is what he said at the trial and this is what I relied upon to say that what he had was, A, patentable over the prior art and, B, that the Cam-Clean product that was then extant infringed the patent; and the point there was to minimize the bending forces, to maximize the shear and to have as little exposed rod as possible. And this in my judgment is what allowed there to be infringement by equivalence, even though there was not necessarily literal infringement in the first claim patent.

You can physically see that there was a channel of spacing that you could say was more than slightly greater than the width of the link end; but when you drew the tangent lines you could see whether it was six-thousandths or 31-thousandths. There still was a very, very close planar

alignment of the places where the forces were transmitted by the link ends to the pivot rod -- therefore, having practically no opportunity for bending and maximizing shear.

I reject Mr. Hayes's argument that shear is solely a function of the multiplicity of link ends. That argument is disproved by the Poerink design. If shear distribution were solely a function of the multiplicity of link ends without reference to spacing or their engagement in proximity to each other, then there would be no patentability of Lepeyre over Poerink and there would not have been any need to make the amendments in Lepeyre in 141 during the prosecution history to obtain patentability; but clearly it is the closeness of the spacing that is

important with regard to where the forces are transmitted.

This was the pivotal point -- not to make a pun -- in the first opinion, and it still is the pivotal point here. It is true that all that has been done in the redesign of Cam-Clean II is an alteration of the spacing, relative spacing of the link ends.

That is true; but if the result is that when the patent language, the claim language is viewed in context of its prosecution history, as it has to be under the doctrine of equivalents, if the result is that even applying the doctrine of equivalents there is no longer a spacing between links that is only slightly greater than the width of the links, then there is no infringement.

That is all there is to it. It is that simple.

To me the telling proof is made up in two ways. Number one, the tests, in my opinion -- although the difference is admittedly small at working loads, at the higher loads, where you would test to ascertain the true strength of the material -- in my judgment the tests show that the Cam-Clean II is less resistant to the bending and elongation forces than the original Cam-Clean; but that is not really the most important question.

The most important question is, what is the spacing of the redesign Cam-Clean relative to the width of the link ends? Therefore, I had Dr. Butler measure or mike the link ends of the Cam-Clean II; and he ascertained that expressing the spacing as percentage of the link end

width it came to 135.85 percent. That is, there is a 35 percent greater spacing than the width of the link end.

Looking at, at least, the embodiment, the only embodiment we have right now of the Lepeyre 141 -- which in my judgment, as I recall the evidence at the first trial, is the essential embodiment of the invention and certainly is consistent with all of the drawings in the 141 -- that is where the link ends are in substantial contact with each other.

The width between the link ends is only slightly greater. That is true. It is only slightly greater; and "slightly" here is viewed by again taking the spacing as a percentage of the link end width. And when you do that in the Intralox belt it comes to 106.14. So, you only have about a 6 percent greater

spacing that the width of the link end. This is only a slightly greater spacing that the width of the link end.

However, 35 percent is about one-third, which in my judgment is more than slightly greater; and I make that conclusion bearing in mind that this is a matter of judgment. You cannot say slightly greater means .2 but not .3, or 3 but not .06.

You cannot make exactly that determination. It is not exact. It is not scientific. It is a sloppy term; but slightly greater, even though it is a sloppy term, has no meaning for this case outside the claims of Patent 141, as interpreted by the prosecution of that patent in the Patent Office and as interpreted by the prior history of this litigation, including Mr. Lepeyre's

testimony, which is what he won on in the first suit.

Now, if, in fact, Cam-Clean was able to redesign so that now the spacing between adjacent links is now more than slightly greater than the width of the link ends, then they are no longer infringing element 4 of Claim 1 of 141. It is true that the belt is not, at rated operating load, significantly weaker than the original Cam-Clean belt was; and if, in fact, Mr. Lepeyre were entitled to a broad claim here that covered all modular plastic belting with multiple links, then certainly the Cam-Clean II, as redesigned, would still infringe and I would so hold. But he is not entitled to a broad patent.

To get around all the prior art and all the inventions of escalators and toys

and powering belt and to get around all that, he had to narrow his claims very, very significantly in order to obtain a patent and to keep it valid; and in doing that he depended upon this question of shear versus bending. And although Dr. Butler says he does not make much of that and Mr. Hayes now says he does not make much of that as a matter of argument, Mr. Lepeyre made a lot of that at the trial and said, that is the thing makes his invention patentable and it is the thing that makes the Cam-Clean invention infringe, the original Cam-Clean infringe on his, because when you looked at where the shear inventing forces were actually transmitted to the rod, you would find that the spacing was not significantly greater than the width of the link end itself.

Here the percentages, as I said, speak for themselves. Six percent in the Intralox; 35 percent in the Cam-Clean II, as redesigned. And in my judgment this product does not infringe Claim 1 of Patent 141. Therefore, there is no contempt of the judgment in 3126 and I find no infringement proved by a preponderance in the 939 case.

Going on to the raised rib -- that is, Claim 21 of 949 -- the essential element of that claim with regard to the spacing of the link ends is in haec verba with the fourth element of Claim 1 of the 141 patent; and it is true that there is not the same file wrapper estoppel in the 949 patent as there is in the 141's. But the testimony of Mr. Lepeyre, applies pari passu to the 141 and 949 patents with regard to the spacing of the link ends, I

do not think there is any question about that. And, furthermore, since the 949 was an improvement patent -- and I think, Mr. Hayes, you will concede it was an improvement patent on the 141, would you not?

MR. HAYES: No.

THE COURT: You will not concede that?

All right: Well, in my judgment the 949 is an improvement patent on the 141. I can understand why you do not want to concede that. If I were you, maybe I would not either; but anyway, I cannot force you to concede that.

It seems to me that 94 is an improvement on the 141 because it is adapted to combing off objects; but the basic design of the drive mechanism and the force transmissions is the same as between 141 and 949, which is why in my

judgment you cannot broaden the spacing claim of 141 by the fact that there is nothing in the 949 spacing claim that narrows it during the prosecution of the 949 patent itself. That is the narrowing of the mother patent -- I do not know whether that is a term of patent art or not -- anyway, the narrowing of the mother patent that took place in 141, it seems to me, has also got to be applied in an improvement patent of 949.

I do not have the case at my finger tips, but that is common sense.

Also, any doctrine of estoppel would reach that same conclusion. Any common law doctrine of estoppel would reach that same conclusion. So I think you are estopped to reclaim any broader sense of the claim language in Claim 21, 949 that is readable in Claim 1 of 141.

Therefore, I find no infringement of Claim 21, 949 because in my judgment the Cam-Clean II as redesigned does not have spacing between adjacent link ends that is only slightly greater than the width of the link ends; and therefore I find no infringement of Claim 21 of 949.

For those reasons I will deny the motion for contempt on marginal order for reasons stated in open court.

Marginal on 142, motion denied for reasons stated in an oral opinion in open court, this date; and Mr. Clerk I would direct you enter a judgment in 87-939 as follows, that the matter having come on for a preliminary hearing and trial having been consolidated pursuant to Rule 65 and for reasons stated by the Court on the record at the conclusion of the trial and hearing, judgment is rendered for the

Defendant against the Plaintiff. Each side to bear its own costs.

All right. That is my judgment.

35 USCS § 271

§ 271. Infringement of Patent

(a) Except as otherwise provided in this title [35 USCS §§ 1 et seq.], whoever without authority makes, uses or sells any patented invention, within the United States during the term of the patent therefor, infringes the patent.

(b) Whoever actively induces infringement of a patent shall be liable as an infringer.

(c) Whoever sells a component of a patented machine, manufacture, combination or composition, or a material or apparatus for use in practicing a patented process, constituting a material part of the invention, knowing the same to be especially made or especially adapted for use in an infringement of such patent, and not a staple article or

commodity of commerce suitable for substantial noninfringing use, shall be liable as a contributory infringer.

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35 U.S.C.S. §271(a), (b), (c) (Law Co-op. 1981 & Supp. 1988).

RULES OF CIVIL PROCEDURE

Rule 52. Findings by the Court.

(a) **Effect.** In all actions tried upon the facts without a jury or with an advisory jury, the court shall find the facts specially and state separately its conclusions of law thereon, and judgment shall be entered pursuant to Rule 58; and in granting or refusing interlocutory injunctions and the court shall similarly set forth the findings of fact and conclusions of law which constitute the grounds of its action. Requests for findings are not necessary for purposes of review. Findings of fact, whether based on oral or documentary evidence, shall not be set aside unless clearly erroneous, and due regard shall be given to the opportunity of the trial court to

judge of the credibility of the witnesses. The findings of a master, to the extent that the court adopts them, shall be considered as the findings of the court. It will be sufficient if the findings of fact and conclusions of law are stated orally and recorded in open court following the close of the evidence or appear in an opinion or memorandum of decision filed by the court. Findings of fact and conclusions of law are unnecessary on decisions of motions under Rule 12 or 56 or any other motion except as provided in Rule 41(b).

Fed.R.Civ.P. 52(a).

House Report No. 97-312, 97th Cong., 1st Session (1981), pp. 37-38.

Section 119 - Technical Assistants

Chapter 17 of title 28, United States Code, provides for the appointment of employees for the United States courts of appeals.

Section 119 of the bill authorizes the Court of Appeals for the Federal Circuit to appoint technical assistants. The purpose of the provision is to authorize the employment of lawyers who have technical degrees and experience in a scientific or engineering field or in patent law in addition to their legal training. The present Court of Customs and Patent Appeals has made use of such technical advisers for many years. The service of these advisers is identical to that of law clerk, except that they

confer with the judges on technical as well as legal matters.

It is important to understand and appreciate the fundamental difference between the use of technical advisers by the Court of Customs and Patent Appeals judges in the ex parte appeals from the Patent and Trademark Office which they now consider and a similar type of help for judges who are called upon to resolve technical issues in adversary patent infringement cases of the kind that will now be heard by the Court of Appeals for the Federal Circuit.

The use of the technical advisers in the Patent and Trademark Office ex parte appeals is probably necessary, as the judges need help in reviewing and assessing arguments and technical points made by the applicant for patent and the

Patent and Trademark Office examiners. This is so because in many of the appeals presently heard by the Court of Customs and Patent Appeals, and especially in chemical and electronics cases, there is sharp disagreement between the applicant and the examiner regarding the technical subject matter involved and the disclosures of the application in issue and of the patents or publications relied on by the examiner in rejecting the application. Obviously, the judges need the assistance of the advisers in resolving these disputes as to the technical aspects of the appeal.

However, to use these advisers in adversary patent infringement cases and have them review and assess the technical aspects of the evidence, as developed by the sworn testimony of witnesses and as

covered by the findings of fact entered by the trial judge, is quite a different matter. It is well established that factual issues in a patent case must be tried and decided by the trial judge or a jury in precisely the same manner as such issues are tried in any other kind of a lawsuit. The technical aspects of a patent case are factual issues, and patent cases are reviewed in the circuit courts of appeals in the same manner as with other appeals.

Thus, it is the settled practice of the circuit courts of appeals in patent cases to honor and respect Rule 52(a) F.R.Civ.P., which provides that findings of fact may not be set aside unless clearly erroneous, giving due regard to the opportunity of the trial court to judge the credibility of witnesses. The

circuit courts have repeatedly held that it is not their function to pass upon or consider de novo the evidence received at the trial or to weigh controverted evidence. For example, in *Hazeltine Research v. Admiral Corp.*, 183 F.2d 953 (7th Cir. 1950), the court condemned the practice of briefing and arguing patent appeals in nisi prius proceedings and emphasized that its function "on review is no different than in any other kind of case." Where a case might have gone either way, the Seventh Circuit has said it will not ignore the entered findings and that it is not its function to make an independent analysis and determination of the factual issues is controversy. *O'Brien v. O'Brien*, F.2d 254, 255 (7th Cir. 1953).

It should be recognized that technical advisers will not be subject to cross-examination, as are experts called by the parties in an infringement action, and there will be no record of the process by which they evaluate and assess the technical aspects of the evidence covered by the trial court's findings or the jury's verdict. Litigants are entitled to know what their record is and that that record is the record made in the trial court. As was stated by the Supreme Court in *Goldberg v. Kelly*, U.S. 254, 269 (1969).

> where important decisions turn on questions of fact, due process requires an opportunity to confront and cross-examine adverse witnesses.

Thus, while the current standard of review of and practices with respect to ex parte appeals from the Patent and Trademark Office are to be continued by the Court of Appeals for the Federal Circuit, it is the desire of the committee that the judges be sensitive to these due process considerations in their employment of technical advisers when reviewing adversary patent infringement cases.